

Title Image-based phenotyping: use of colour signature in evaluation of melon fruit colour
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Abstract

Fruit colour, both external and internal, is important because it relates directly to the commercial value of the product. In breeding and in pre- and postharvest studies of fruit colour, an effective method for evaluating colour is needed to replace subjective evaluations by eye. We used a series of data processing and statistical analyses used in content-based image retrieval to evaluate melon flesh colour, and assessed the efficacy of this approach. This method relies on summarizing colour information from images into colour signatures, calculating the earth mover's distance (EMD) between colour signatures, and multi-dimensional scaling (MDS) based on an EMD matrix. Performing MDS on a set of fruit flesh images revealed important colour features, such as the yellowish-green strength in green-fleshed melons and the relative size of the green and red parts in red-fleshed melons, without the need for an explicit definition of these features. The proportion of variance due to differences among cultivars was higher by MDS than by traditional evaluation, indicating that this new method performed best at detecting colour differences among cultivars. The method provides effective, objective indicators of fruit colour, and shows considerable promise for use in research and breeding programs.

<http://www.springerlink.com/content/a2t70hr26773r636/fulltext.pdf>